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AUTHOR Hanson, Earl
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ABSTRACT

This paper reviews some of the physiological characteristics of the reading act, including the structure of the eye and the limits and focusing area of eye fixations. It then outlines a four-part method for increasing reading rates of reading both easy and study-type materials, a method that can be used over 20 one-hour sessions with students who possess sufficient vocabulary and adequate comprehension. The conclusion of the paper stresses the importance of personal tempo as a factor in the variation of reading rates across individuals of equal intelligence and ability. (RL)

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Increasing Reading Rates -- Consideration of Physiological Limitations and Suggestions for Teaching

Earl Hanson
Reading Faculty
Department of Curriculum and Instruction
Northern Illinois University
DeKalb, Illinois 60115

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When on casually observes a person reading, the readers eyes will probably appear to be sweeping from left to right across lines of print. Closer examination, however, reveals that the eyes are not moving smoothly. They are starting and stopping; they are jerking across the printed page.

If a person is reading general material for information or pleasure, his or her eyes will stop on an average of three times per line. When the material is difficult for the reader, there will be regressions and more fixations.

Perception of printed symbols does not take place while the eyes are moving, only when the eyes are stopped. When the eyes are stopped, it is important to note, the span of fixation is very limited. The area of clearest vision covers only about four letter spaces. About twelve to fifteen letters can be perceived in one fixation of the eye. Ruediger found that letters in eleven point type could be perceived fairly accurately at one inch (twelve to fifteen letter spaces) from the fixation point. There were no distinct boundaries to this area, as the clearness of form faded off gradually.[1]

Span of perception is limited by the anatomy of the eye. The eye is a round globe-like structure with a tough, white covering on the outside called sclera. It is lined with a dark membrain called the choroid which serves to keep light from coming through the wall of the eye. On the inside of the eyeball next to the choroid lies the retina, the receiving screen for the optical image.

Two types of receptor cells or nerve endings are present in the retina. They are called rods and cones because of their shape. However, rods and cones differ not only in shape but also in type of nerve connection to the brain. Each cone has an individual pathway to the brain. Many different rods may be connected to a single pathway.

The number of cones or rods per unit area varies in different parts of the retina. Consequently, sensitivity over the surface of the retina is not uniform. At the center of the retina is a small pit or depression known as the fovea, or macula, where the nerve endings are all cones. Because each cone has a direct path to the brain, it is the fovea that can most readily discriminate detail, and it is because the area of the fovea is so small that our span of perception is physiologically limited.

The research tends to show that individuals are capable of perceiving about 1400 words per minute.[2] However, more important than speed and span of perception in determining reading speed is rate of understanding. The question often arises, "How fast can one or should one read?" Walton in his investigation of vision and rapid reading concluded that adults normally read between 220 and 270 words per minute.[3] However, the answer to the question is contingent on one's purpose for reading a particular selection and the nature of the material. Regarding purpose: if one is reading to understand complex discourse, to solve problems in mathematics or to follow experimental procedures, for example, he or she must read slowly. On the other hand, if a person is reading simply to obtain general information or for pleasure, they

can read more rapidly. Regarding the nature of the material: the easiest materials to read appear to be light short stories and novels.[4] The most difficult are probably scholarly works in different fields of study.

It follows that two types of materials might be identified: study type reading and easy reading. The purpose of instruction to increase reading rate is not simply to increase rate of reading but to develop flexibility of reading rate. By flexibility of reading rate is meant the ability to adjust one's rate of reading to his or her purpose for reading and the nature of the material.

Although reading rates attained through participation in some programs for increasing reading rates appear to have been exagerated, there is evidence to show that rates of reading easy and study-type material can be significantly increased through proper training. A program developed at the University of Chicago Reading Clinic utilizing the following procedures has been shown to be effective:

1. Practice in rapid reading of easy material at forced rate, accompanied by general questions. Pacers are used to help students push themselves to read more rapidly. The material read should be easy, such as light novels and adventure stories of interest to the reader.
2. The reading of easy material accompanied by general questions without a pacer. Unspeeded reading rates are calculated, and a record of the selections read and the unspeeded rates of each student is maintained. The unspeeded

reading rate attained is used to determine the initial rate setting of the student's pacer for subsequent practice at forced rate.

3. Practice in reading study-type materials without a pacer; adjusting rate in order to understand concepts, note details, grasp main ideas, perceive relationships, draw inferences and make interpretations. The selections read are accompanied by general and specific questions. Material is drawn from textbooks, manuals and study-type exercises. The student's rate of reading study-type material and the extent of his or her comprehension of the selections read are recorded.
4. Students alternate between reading easy and study-type material, devoting about the same amount of class time to each in order to develop flexibility. As a means of motivation, it is suggested that students, individually, plot and maintain their own record of progress.

Following the foregoing procedure, students have attained marked increases in rates of reading easy and study-type materials.[5] Maximal reading speed is usually attained in about twenty, one-hour sessions.[6] It is important to note that reading rate training should be undertaken with students who possess sufficient vocabulary and adequate comprehension. Otherwise, attempting to increase reading speed simply causes the student to make more mistakes faster.

Curiously, it is evident that the maximum reading speeds attained by students of equal intelligence and comprehension ability vary widely.[7] A possible explanation for the variation is that reading rates are partially determined by personal tempo.

During the early years of psychological inquiry, European investigators noted that individuals tended to be remarkably consistent in the rate at which they performed certain motor tasks, and they termed the phenomenon personal or human tempo. As described by Frischeisen-Kohler, "there is an individual tempo of personality, the personal tempo, which is expressed more or less markedly in all our doings, in our acts of perception and our volitional processes."[8] Later research tended to characterize the concept as an integral, stable component of personality which could be described in terms of multiple factors.[9]

Although many tests of personal tempo have been developed, they have not been particularly useful in predicting the reading rates of individuals. Presently, there appears to be no reliable procedure for estimating one's potential rate of reading.[10] Considering the complexity of the reading process, that reading rates are influenced by many different interrelated factors such as speed and span of perception, the readers background of experience and his or her purpose for reading, this is not surprising.

Notes and References

[1] Miles A. Tinker, Bases for Effective Reading (Minneapolis: University of Minnesota Press, 1965), pp. 12-13.

[2] Howard N. Walton, "Vision and Rapid Reading," American Journal of Optometry and Archives of the American Academy of Optometry, 24 (February, 1957), pp. 73-82.

[3] Ibid

[4] Charles H. Judd and Guy T. Buswell, Silent Reading: A Study of the Various Types. Supplementary Educational Monographs, No. 23 (Chicago: University of Chicago Press, 1922), p. 23.

[5] Earl F. Hanson, "Relationships of Personal Tempo to Reading Rate Among College Students," (Unpublished dissertation, Department of Education, University of Chicago, 1971), pp. 90-91.

[6] Helen M. Robinson, Manual of Instruction, Reading Rate Controller. (Chicago: Stereo Optical Company, 1954), p. 7.

[7] June F. Mitchell, "Prediction of Increase in Silent Reading Rate," Clinical Studies in Reading II, Supplementary Educational Monographs, No. 77 (Chicago: University of Chicago Press, 1953), pp. 89-93.

[8] Ida Frischeisen-Kohler, "The Personal Tempo and its Inheritance," Character and Personality, 1 (June, 1933), p. 302.

[9] Horacio Kimoldi, "Personal Tempo," The Journal of Abnormal and Social Psychology, 46 (July, 1951), pp. 283-303.

[10] Hanson, op. cit., p. 106.